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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
WILLS, LAWRENCE E	

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/798,094	CONDON ET AL.	
	Examiner	Art Unit	
	LAWRENCE E. WILLS	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 February 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 2, 2009 has been entered.

Response to Arguments

2. Applicant's arguments with respect to claims 1-16 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 5-6, 7, 11-12, 13, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scott (US Patent No. 5,097,518) in view of Stephenson (US Patent No. 5,347,597).

Regarding claims 1, 7 and 13, Scott'518 teaches a system operable to scale a halftone image using error diffusion (Fig. 4B), the system *comprising*: a spooler (DMA circuit 365 in conjunction with image memory 370, Fig. 3, to transfer an image between memory 370 and any other component within framestore, column 11, lines 55-60) operable to convert a contone image into the halftone image for processing (each contone pixel value can be appropriately thresholded to yield a corresponding bi-tonal pixel value which is subsequently processed, column 48, lines 47-50); and an error diffusion scaler (number 335, Fig. 3, performing error diffusion pixel replication enlargement scaling as seen in Fig. 4B and Fig. 6A) operable to identify a first matrix of n x m pels in the halftone image (image is broken into pixel blocks, column 15, line 42), but fails to expressly teach to calculate an average intensity of the first matrix of pels, to generate a second matrix of (n+1) x m pels from the first matrix of pels by inserting a line of pels in the first matrix of pels, to generate a scaled output matrix of (n+ 1) x m pels from the second matrix of pels by assigning new pel values to each pel in the line of pels using an error diffusion process, wherein the average intensity of the scaled output matrix of pels is substantially unchanged from the average intensity of the first matrix of pels, and to perform the previous steps for each unidentified matrix of n x m pels in the halftone image to generate a scaled output of the halftone image.

Stephenson'597 teaches a scaler to calculate an average intensity of the first matrix of pels, (average of the densities of pixels 1 and 2, column 3, line

61) to generate a second matrix of (n+1) x m pels (block 37, Fig. 2, Vertical Interpolation line) from the first matrix of pels (block 37, after Horizontal Interpolation) by inserting a line of pels in the first matrix of pels (the center line of pixel in block 37 is newly generated ,column 3, lines 63-64), to generate a scaled output matrix of (n+ 1) x m pels from the second matrix of pels by assigning new pel values to each pel in the line of pels (the center line is made up of individual pixels each having a density equal to the average of the densites of its immediate neighbors in the outer lines, column 3, lines 64-66), wherein the average intensity of the scaled output matrix of pels is substantially unchanged from the average intensity of the first matrix of pels (the pixel between pixels 1 and 1 has a density equal to their average density, column 3, lines 67-68), and to perform the previous steps for each unidentified matrix of n x m pels in the halftone image to generate a scaled output of the halftone image (the entire process then begins again at start and continues until each pair of lines of pixels in the original image has been processed, column 5, lines 38-40).

Having a system of Scott'518 reference and then given the well-established teaching of Stephenson'597 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the error diffusion scaling system of Scott'518 reference to include the use of neighboring averages to fill blank newly inserted pixels as taught by

Stephenson'597 reference, since the average value of the pels would be persevered allowing for a more accurate depiction of the contone image.

Regarding claims 5, 11, 17, Scott’518 fails to teach identifying a n' x m' matrix of pels around each pel in the line of pels, wherein n' > n and m' > m; and assigning each new pel value in the scaled output matrix of pels using a threshold based on an average intensity calculation of pel values in the n' x m' matrix of pels.

Stephenson’597 teaches identifying a n' x m' matrix of pels around each pel in the line of pels, wherein n' > n and m' > m (Vertical number 41 Fig. 2); and assigning each new pel value (the pixel between pixels 1 and 1 has a density equal to their average density, column 3, lines 67-68) in the scaled output matrix of pels (output image, Fig. 2) using a threshold based on an average intensity calculation of pel values (99, 101, 103, Fig. 5) in the n' x m' matrix of pels (the center line is made up of individual pixels each having a density equal to the average of the densites of its immediate neighbors in the outer lines, column 3, lines 64-66).

Having a system of Scott’518 reference and then given the well-established teaching of Stephenson'597 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the error diffusion scaling system of Scott’518 reference to include the use of neighboring averages to fill blank newly inserted pixels as taught by

Stephenson'597 reference, since the average value of the pels would be persevered allowing for a more accurate depiction of the contone image.

Regarding claims 6,12,18 Scott'518 fails to teach identifying a n' x m' matrix of pels around each pel in the line of pels, wherein n' > n and m' > m; and assigning each new pel value in the scaled output matrix of pels based on a calculation of a rounded weighted mean of pel values in the n' x m' matrix of pels (the center line is made up of individual pixels each having a density equal to the average of the densites of its immediate neighbors in the outer lines, column 3, lines 64-66).

Stephenson'597 teaches identifying a n' x m' matrix of pels around each pel in the line of pels, wherein n' > n and m' > m (Vertical number 41 Fig. 2); and assigning each new pel value in the scaled output matrix of pels based on a calculation of a rounded weighted mean of pel values in the n' x m' matrix of pels (the center line is made up of individual pixels each having a density equal to the average of the densites of its immediate neighbors in the outer lines, column 3, lines 64-66).

Having a system of Scott'518 reference and then given the well-established teaching of Stephenson'597 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the error diffusion scaling system of Scott'518 reference to include the use of neighboring averages to fill blank newly inserted pixels as taught by

Stephenson'597 reference, since the average value of the pels would be persevered allowing for a more accurate depiction of the contone image.

5. Claims 2-4, 8-10, and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scott (US Patent No. 5,097,518) in view of Stephenson (US Patent No. 5,347,597) as applied to claims 1, 7, and 13 above, and further in view of Li (US Patent No. 6,563,957).

Regarding claims 2, 8, 14 the combination of Scott'518 and Stephenson fail to expressly teach wherein the error diffusion scaler is further operable to generate a (n+l) x m shift matrix based on the second matrix and including at least one shift indicator defining an exchange between a pel and its neighboring pel, wherein a probability of occurrence of the at least one shift indicator in a position of the shift matrix is proportional to a distance between the position and the line of pels in the second matrix, and to exchange at least one pel in the scaled output matrix with its neighboring pel based on the shift matrix.

Li’957 teaches wherein the error diffusion scaler is further operable to generate a (n+l) x m shift matrix (iterative E, equation 17, column 10, lines 5-13) based on the second matrix (the halftone image, column 10, line 16) and including at least one shift indicator (greatest decrease in the error, column 10, lines 19-20) defining an exchange between a pel and its neighboring pel

(toggling the pixel of swapping it value with one of its eight nearest neighbors, column 10, lines 17-18), wherein a probability of occurrence of the at least one shift indicator in a position of the shift matrix (P, Fig. 9) is proportional to a distance between the position and the line of pels in the second matrix (W[1,-1] W[1,0] W[1,1] Fig. 9), and to exchange at least one pel in the scaled output matrix with its neighboring pel based on the shift matrix (toggling the pixel of swapping it value with one of its eight nearest neighbors, column 10, lines 17-18 based on the cost function, equation 16 or 17).

Having a system of Scott'518 and Stephenson'597 reference and then given the well-established teaching of Li'957 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined scaling system of Scott'518 and Stephenson'597 reference to shift pixels to minimize error using a cost function as taught by Li'957 reference, since the results would allow for a greater decrease in error allowing for a more accurate depiction of the contone image.

Regarding claims 3, 9, 15 the combination of Scott'518 and Stephenson'597 fail to expressly teach wherein no pel in the first matrix of pels is shifted more than one position from its neighboring pels to generate the scaled output matrix.

Li'957 teaches wherein no pel in the first matrix of pels is shifted more than one position from its neighboring pels to generate the scaled output

matrix (notice Fig. 9, and if any change reduces the error, the change which gives the greatest decrease in the error is accepted, column, 10, lines 19-21).

Having a system of Scott'518 and Stephenson'597 reference and then given the well-established teaching of Li'957 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the combined scaling system of Scott'518 and Stephenson'597 reference to shift pixels to minimize error using a cost function as taught by Li'957 reference, since the results would allow for a greater decrease in error allowing for a more accurate depiction of the contone image.

Regarding claims 4, 10, 16, the combination of Scott'518 and Stephenson'597 fail to expressly teach wherein no pel in the first matrix of pels is shifted more than once to generate the scaled output matrix (notice Fig. 29, and if any change reduces the error, the change which gives the greatest decrease in the error is accepted, column, 10, lines 19-21).

Li'957 teaches wherein no pel in the first matrix of pels is shifted more than once to generate the scaled output matrix (notice Fig. 29, and if any change reduces the error, the change which gives the greatest decrease in the error is accepted, column, 10, lines 19-21).

Having a system of Scott'518 and Stephenson'597 reference and then given the well-established teaching of Li'957 reference, it would have been obvious to one having ordinary skill in the art at the time the invention was

made to modify the combined scaling system of Scott'518 and Stephenson'597 reference to shift pixels to minimize error using a cost function as taught by Li'957 reference, since the results would allow for a greater decrease in error allowing for a more accurate depiction of the contone image.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAWRENCE E. WILLS whose telephone number is (571)270-3145. The examiner can normally be reached on Monday-Friday 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Poon can be reached on 571-272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/King Y. Poon/
Supervisory Patent Examiner, Art Unit 2625

LEW
April 23, 2009